APPENDIX D
SURFACE TREATMENT FACILITIES

Oil and non-oily wastewater is processed in the wastewater treatment plant (WWTP) to separate oil, water and solids. The facility operates two wastewater treatment plants; the Area 1 & 2 WWTP, and the Area 3 WWTP. A block flow diagram of the Area 1 & 2 WWTP is attached. The process design of the Area 3 WWTP is similar to the Area 1 & 2 WWTP; therefore, the following discussion applies to both facilities.

Oil Wastewater Treatment

The oily wastewater collection system is segregated from the non-oily wastewater collection system. Oily wastewater collected from the refinery enters the inlet sump for primary oil, water and solids separation. Oil collected from the inlet sump is returned to the refinery for processing. Water and solids are pumped to the Surge Tank.

The surge tank is used for wastewater equalization. Oil skimmed from the tank is returned to the refining process. Fluids in the tank are sent to the corrugated plate interceptors (CPI), which provide additional separation of oil and water. Oil collected in the CPIs is returned to the refinery for processing. Water from the CPIs is sent to the induced air floatation (IAF) devices.

The IAF provides additional separation of oil and water by use of hydraulically powered aeration units that draw air into the IAF and thoroughly mix the air with water. This process creates minute air bubbles that attach to small particles of solids and oil. The resulting floating "froth" is separated from the water by weirs and returned to the inlet sump. Water from the IAF units is combined with the non-oily wastewater and sent through the Non-oily wastewater treatment.

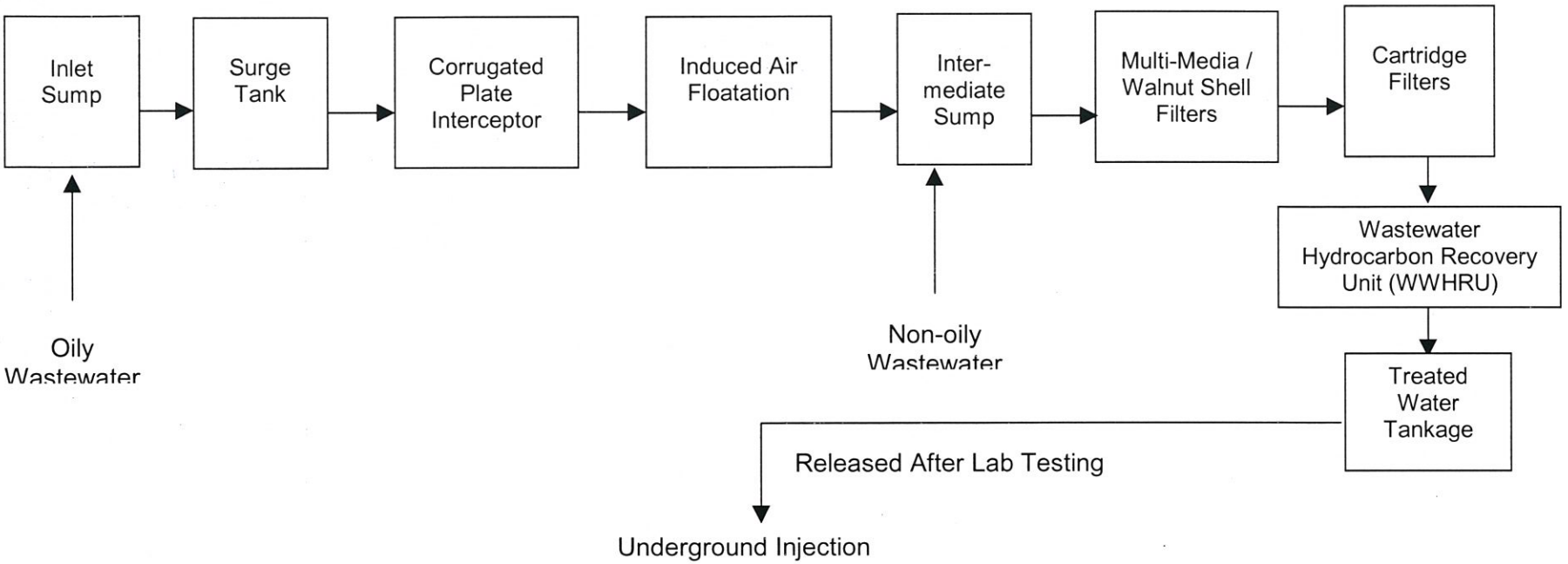
Non-Oily Wastewater Treatment

Non-oily wastewater and IAF effluent are combined at the intermediate sump prior to filtration through either the multi-media filtration units or the walnut shell filtration units. Both units remove small oil and solid particulates from wastewater. The cartridge filters provide final removal of particulates.

Cartridge filter effluent is sent to the Wastewater Hydrocarbon Recovery Unit (WWHRU) for removal of recoverable hydrocarbons and is sent to one of two tanks for storage until the contents can be tested and approved for discharge to the injection wells. Surge tanks are utilized prior to the injection pumps.

Other Units or Processes at the Wastewater Treatment Plant

Several units not directly involved in the treatment plant include the recovered oil sump, vacuum truck disposal pit, and filter backwash pit.



Area 1 & 2 Wastewater Treatment Plant
Block Flow Diagram

(Area 3 Wastewater Treatment Plant is similar in design)